Insight into Nature of Electron-Photon Relationship Suggests Novel LED Design

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Introduction

Two important gaps in current scientific knowledge; one of them concerning the nature of the relationship between electrons and photons (known to be a one-for-one relationship but little being known beyond this) and the other being a failure to understand the dynamics at play in Light Emitting Diodes; presents an opportunity for re-examination of previous assumptions and a re-design of LED technology that should provide a boost to the efficiency of LEDs.

Abstract

Both photons and electrons share in common that they have mass and a discrete magnetic field, with the magnetic field and mass of the photon being far lesser than that of the electron. It stands to reason that if photons have uniform mass and magnetic effects, an identical process is at work in the creation of photons from electrons.

It is currently accepted as fact that electrons cannot be reflected as photons are. This, I would suggest, is not the case. Photons are more readily reflected by electron clouds of solid materials in reflective configurations due to their comparatively low mass. However, I would suggest that not only can electrons be reflected, electron-electron reflection events have been happening for a long time right under our noses. We have been referring to these events for years as "spontaneous emission events."

Current literature describes spontaneous emission as being the result of a nucleus of an atom energetically "kicking" an electron from one energy state into another and with the emission of a photon being the byproduct of this shift in energy states of electrons. This is patently false. This misconception has been responsible for frustrating research into light emission devices as well as other research areas.

I would suggest that what is actually happening in spontaneous emission events is that the Coulomb forces that would ordinarily help to keep electrons from coming too close to one another while orbiting an atom are being overcome by the effects of positively charged nuclei which oscillate with substantial force (as in the case of a thermally hot material giving off infrared light) and that these interactions can result in electron triplets forming from electrons in the *same* electron shell being nudged toward the same orbital position and moving at an acute angle with relation to one another, eventually merging at common points in an orbit. These groupings of three electrons, if they make a close approach to an electron singlet moving in the opposing direction, would have three important

effects on the single electron: 1.) The combined magnetic output of the triplet would negate some of the mass of the electron. 2.) The magnetic and Coulomb force associated with the triplet would cause the opposing single electron's angular momentum to be inverted. 3.) This inversion would, as in the case of photonic reflection, lead to a brief period of decreased inertia and increased magnetic moment.

These three effects having been manifest, the single electron would have a reliably consistent portion of its mass stripped from it by dint of the transfer of its angular momentum into rotational energy during this inversion process. Although the triplets that bring about these directional inversions may strike singlets at different angles and with different intensities (which ought not to create mass-uniformed photons if the mass-negation were purely the result of interaction with the triplet,) if this mass-negation were internally-driven by the mass-negating effects of the temporarily boosted magnetic field of the singlet during the directional inversion would explain the uniformity of mass of photons. Variations in the frequency of light given off through spontaneous emission are the result of the probability of triplet formation in a material, a fact which accounts for why it is often difficult to produce certain colors of light in an LED (or with fireworks, for that matter.) Greater control over triplet formation should mean not only more efficient LEDs, but LEDs with a wider variety and purity of colors. These goals have heretofore been difficult to attain as no one conducting research into LEDs, to date, has attempted to bring about the deliberate collision of electron triplets with singlets.

Importantly, for a photon to be converted into an electron once again, the mass of the photon would need to be restored, which calls for an entirely different influence to be exerted which involves there being an absence of nearby electrons but the presence of a substantial neutrino field resulting primarily from the positively charged nucleus of an atom. These fields, in the absence of nearby electrons, routinely allow for the conversion of photons back into electrons, something we generally refer to as a photovoltaic process. Ibid. previous publications concerning electron cloud asymmetries and their usefulness for photovoltaics.

These things being taken into consideration, we now have an insight into how Light Emitting Diodes actually work which informs a novel concept for LED design.

Rather than a single N-type layer in an LED, there ought to be two N-type layers with the P-type sandwiched between the two. One of the N-type layers would feature magnetic structures that corral electrons into triplets as they arrive in the depletion zone. The other N-type layer would be designed to produce singlets exclusively and with avoidance of triplets being emphasized.

Conclusion

The recognition of the fact that spontaneous emission events must be driven not by alterations to energy states but rather by interactions between countervailing electron triplets and electron singlets upends decades of assumptions by the physics community concerning light emission and the nature of photons, themselves.

Photons are, as many have suspected, very much akin to electrons with the operative difference between them being the depletion of mass induced by sudden directional inversions which are, in turn, produced by singlet-triplet mutual electron-electron interactions. With this new understanding, researchers will be able to pursue a more direct path toward future breakthroughs.